FACE INVESTIGATION

SUBJECT: Construction Laborer Dies After Being Jolted From a Tractor Seat and Pinned Under the Tractor Tire

SUMMARY: A 36-year-old male construction laborer (the victim) died after the tractor he was driving struck a hidden culvert and he was jolted from the seat, then pinned under the rear wheel. He worked for a road construction company that was replacing guardrails and installing silt fences on a state highway overpass under new construction. On the day of the incident, four co-workers and the victim started working at the site about 7:30 AM. They completed most of the work on the guardrails in the morning and early afternoon, so the victim was assigned to finish up the silt fence plowing. He was using a 1974 tractor with wide-set front wheels to plow a trench when a front tire struck a hidden concrete culvert. The victim was jolted from the tractor seat, while the tractor continued to roll until it came to rest on his back. The tractor was not equipped with a roll over protective structure (ROPS) or operator restraint system.

To prevent future fatalities of this type, the FACE investigator recommends employers should:

! **provide tractors that are fully equipped with an operator restraint system and rollover protective structures (ROPS)**

! **conduct a thorough evaluation of the terrain prior to beginning an operation with a tractor, and inform workers of the hazards and safe work practices to avoid them.**

Additionally, agencies responsible for setting standards for road construction should**:**

! **develop contract requirements for marking structures in ditches that may be hazardous to individuals working in those areas.**

INTRODUCTION:

On May 27, 1998, a 36-year-old male construction laborer died after being pinned under a tractor wheel. The Wisconsin FACE field investigator was notified by a friend of the victim's family on May 28, 1998. On June 6, 1998, the field investigator visited the site and began interviews of the victim's family. The employer declined to be interviewed. The FACE investigator also obtained the death certificate and the coroner and sheriff's reports.

The employer was a road construction contractor that primarily provided roadside landscaping services for new and rebuilt state highways. The size and age of the company is unknown, as well as specific information about the company's safety history and training programs.

The victim had worked for the company for over seven years. His work duties usually involved placing and watering sod along road construction sites, or seeding grass in these areas. It is unknown if he had previously operated the tractor involved in the incident.

INVESTIGATION:
The incident occurred at a road construction site where new on and off ramps were being installed for an existing highway. The company assigned a five-person crew, including the victim and a crew foreman, to remove existing guardrails and install silt fences for erosion control. Terrain in this area was uneven, with a 15E slope from the road to the area where the silt fence was to be built. Grass was 2-3 feet high, and puddles of water from recent rainfalls had collected in lower areas. The company brought a 24-year-old tractor with a single-blade plow to the site to plow a trench for the silt fence. This tractor had wide-set front wheels, but was not equipped with ROPS or an operator restraint system.

The crew began their workday about 7:30 AM. In mid-afternoon, when most of the guardrail work was completed, the victim began plowing where he had been directed to install the silt fence. He plowed the length of trench as directed by the crew foreman, then lifted the plow and turned the tractor around. After traveling about 80 feet, the left front tire struck a concrete culvert that was hidden in the tall grass, and the right tire went into a 8" deep puddle. The victim was jolted from his seat at the impact, and fell off the right side of the tractor. The tractor apparently shut off at the impact of hitting the culvert, but continued to roll forward, passing over the victim's body before coming to a stop. Meanwhile, his co-workers finished the guardrail work, and drove two trucks to join the victim near the silt fence. They found him with the tractor wheel resting near his back. EMS was summoned, and transported the victim to the hospital where he was pronounced dead.

CAUSE OF DEATH: The coroner's report listed the cause of death as crushing chest and abdominal injuries.

RECOMMENDATIONS/DISCUSSION

Recommendation #1: Employers should provide tractors that are fully equipped with an operator restraint system and rollover protective structures (ROPS) .

Discussion: The tractor in this incident was not equipped with a seatbelt or ROPS when it was manufactured in 1974. A seatbelt or other operator restraint system would have prevented the victim from being jolted from the seat when the wheel hit the culvert. However, seatbelts should not be used on a tractor that does not have ROPS. A retrofit system for the tractor in this incident is available from equipment dealers for about $2000, including the operator restraint system and ROPS. ROPS should always be used with an operator restraint system to keep the operator within the zone of protection in case of an overturn.

Recommendation #2: Employers should conduct a thorough evaluation of the terrain prior to beginning an operation with a tractor, and inform workers of the hazards and safe work practices to avoid them.

Discussion: It is unknown if the crew foreman was aware of the culvert, or if the victim was notified of the location of the culvert and other possible hazards in the area before he started operating the tractor. If the victim had been alerted to the presence of the culvert, he might have taken action to avoid driving the tractor in that vicinity.

Additionally,

Recommendation #3: Agencies responsible for setting standards for road construction should develop contract requirements for marking structures in ditches that may be hazardous to individuals working in those areas.

Discussion: In this case, the culvert under the existing road had been in place for an unknown number of years, and was obscured from view by old vegetation and soil mounds. The state engineer's plans for the new construction included the location of the existing culvert, with notation that it would remain. At the time of the incident, the state transportation agency did not specify the use of marker posts at the ends of culverts.

Note: On October 15, 1998, the state transportation agency distributed a new policy to mark cross culvert ends with flexible marker posts that extend 1.22 meters from the upper level of the culvert. The design notes stated "The primary function of the marker post is to spot culvert ends for maintenance and survey personnel."